"EFFECT OF NURSE LED TECHNOLOGY ENABLED ANTENATAL CARE ON QUALITY OF LIFE, MATERNAL AND FETAL OUTCOME AMONG PRIMIGRAVID WOMEN IN SELECTED HOSPITALS, SALEM A RANDOMIZED CONTROL TRIAL"

Synopsis

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IV	Grant Certificate Copy Right
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ABSTRACT

In recent years, mobile technologies have been widely used in the provision of pregnancy care services, benefiting from the rapid development of information communication technology (ICT) and universal access to these technologies. In addition to quick and easy access to health information mHealth apps can improve interactions with the health care system. Mobile apps can also promote health behaviours such as maintain sufficient physical activity and having a healthy diet.

OBJECTIVES

This study aimed to evaluate the effectiveness of technology enabled antenatal care on quality of life, maternal and fatal outcome among primi gravid women in study group.

METHODS

A Randomized control design was used to select the participant according to the inclusion criteria. A total of 160 participants were assigned to study group and control group. The study group had app application (e-macc) installed for the pregnant women individually which includes aspects of antenatal care from 12 week of gestation to postpartum period. Pre test assessment on quality of life was assessed by using the WHO BREF scale for both study and control group before app application. The control group received routine care from the hospital. The maternal outcome, fetal outcome was assessed using observational checklist for the study group and control group during delivery. And post assessment was done regarding quality of life during I, II, III trimester, postpartum period for both study and control group.

RESULTS

The present study results proved that, there was a statistically significant improvement in overall quality of life after app application (emacc), the mean difference in study and control group 24.306, t value obtained 13.64 $P<0.001$ highly significant. In study group obtained t value was 0.075 whereas in control group 0.2333 quality of life in relation to apgar score. In contrast, the study group birth weight obtained value 0.024 whereas in control group 0.288 about correlation between quality of life relation to labor pain.

CONCLUSION:

This study concludes that a mobile app application (e-MACC) effectively enhances the quality of life and improved maternal, fetal outcome among primi gravid women. These findings emphasize the mhealth app significantly improve the quality of life, maternal, fetal outcome among primi gravid women and have positive pregnancy experience.

CHAPTER I
INTRODUCTION

1. BACKGROUND OF THE STUDY

Pregnancy is a very special time in a woman's life, a time of important and complex step that can lead to the fall the previous personal balance and looking for new. The phase potentially critical, is often accompanied by anxiety, negative emotions, worries and stress about themselves the couple's life, the baby. Among the many interventions available for the welfare of pregnant women, new technologies are playing an important role, thanks to its spread, the lower costs and its peculiar characteristics (interactivity, sociality, customizability, ubiquity, multimodality, velocity, etc). Smart phones and tablets in particular are proving excellent tools to accompany women on this journey toward a healthy motherhood.

In recent years, mobile technologies have been widely used in the provision of pregnancy care services, benefiting from the rapid development of information communication technology (ICT) and universal access to these technologies. More social media and mobile health (mHealth) apps are being used today, taking the place of traditional text message or email services. Social media websites provide women with a platform for obtaining health information and interactions with health professional and peers. In addition to quick and easy access to health information mHealth apps can improve interactions with the health care system. Mobile apps can also promote health behaviours such as maintain sufficient physical activity and having a healthy diet.

According to global statistics, Maternal mortality ratio (per 1,00,000 live births) has improved by 218 deaths per 1,00,000 live births from 441(403-490 in 1985 to 223(202-255) in 2020. National statistics showed that, Maternal Mortality rate (MMR0 in India was 97 per 100,000 live births in 2018-2020.This is 6 point decline from the previous period of 2017-2019, when the MMR was 103 per 100,000 live births state (Tamil Nadu) The Maternal mortality Ratio in Tamil Nadu in 2024, 39.4 per one lacs live birth. This is a significant drop from the MMR of 45.5 per one lac live birth in 2023-24. It showed that antenatal care had significant role in reduction of MMR.

NEED FOR THE STUDY

The use of social media and mHealth apps has been increasing in pregnancy care because of the low cost and their easy access regardless of time and geographic location. This meta-analysis synthesized the findings of 15 RCT studies conducted in different countries and regions and provides evidence on the effectiveness of these technology based interventions in providing health care services to pregnant and postpartum women. Moderate to large effect sizes were found in regard to different health outcomes including maternal physical health, mental health, and knowledge about pregnancy. In additions, we investigated the characteristics and components of the interventions that may affect program effectiveness.

NOVELTY OF THE STUDY

Though Many pregnancy apps available both private and government scheme towards antenatal care which includes minor disorders and its management, antenatal advises which is developed both English and Tamil language**.** It was user friendly.

1.2 AIM

To evaluate the effect of nurse led technology enabled antenatal care on quality of life maternal and fetal outcome among primi gravid women.

1.3 OBJECTIVES

1.3.1 PRIMARY OBJECTIVES

- To assess and compare the pre and post test quality of life and among primi gravid women in study and in control group.
- To assess and compare the maternal and fetal outcome in study and control group.
- To evaluate the effectiveness of Nurse led technology enabled antenatal care on quality of life, maternal and fetal Outcome among primi gravid women in study group.
- To correlate the mean pre and post test scores of qualities of life with maternal and fetal outcome among the primi gravid women in study group and in control group.
- To associate the pre and post test quality of life, maternal and fetal outcome among primi gravid women with their selected demo graphic and clinical variables in study and control group.

1.3.2 SECONDARY OBJECTIVES

- To assess the post test level of perceived level of satisfaction among primi gravid women in study group.

1.4. OPERATIONAL DEFINITION

Effectiveness: Refers to the outcome of technology enabled antenatal care, quality of life by WHOQOL BREF scale, maternal outcome by numerical pain intensity scale and partograph, observation check list and fetal outcome by observation check list, among primi gravid women from 28 weeks of gestation till labor. Followed by postpartum period.

Technology Enabled Antenatal Care: It Refers to the app created by the investigator named (e-Macc) the investigator provided the necessary information to the samples regarding app installation. With the help of supportive staffs, the app initiated in individual pregnant women by registering their name and email id. The sticker containing logo sticked on the intervention group case sheet. The samples watch the app every day that can be monitored by admin end. If any query the samples can use help desk which available in the app itself. The mobile app regarding antenatal care which includes checkup, diet, exercises, immunization, medication, travel, clothing, sex, warning signs. The above information displayed in the mobile by pictures, images, where the antenatal women can read and make use of the details, also push up notifications regarding checkup, vaccination, drugs to be taken will show as reminder till the date of delivery. App installation was done for the pregnant women – follow up done through whats app.

Quality of life: It refers to the individual perception of living situation understood in a cultural context, value system and in relation to the objectives, expectation and standards of a given society. It can be assessed by WHOQOL BREF scale.

Maternal Outcome: It includes reduction of labor pain, by numerical pain intensity scale, shortened duration of 1^{st}& 2^{nd} stage labor, less likely to require oxytocin augmentation of labor by partograph spontaneous vaginal delivery, by observational check list.

Fetal Outcome: It refers to absence of birth injuries, normal apgar score (10/10), birth weight. It is assessed by observation check list.

Primi gravid Women: Refers to the women who conceive for the first time and complete 12 weeks of gestation.

1.5 HYPOTHESES

1. H_1- There is a significant difference in the pretest and posttest level of quality of life, maternal and fetal outcome among primi gravid women in study and in control group

2. H_2- There is a significant correlation of the pretest and posttest level of quality of life with the maternal and fetal outcome among primi gravid women in study and in control group

3. H3- There is a significant association of the pre and post test quality of life, maternal and fetal outcome among the primi gravid women with their demographic and clinical variables. On perceived level of satisfaction with their selected demographic variable.

1.5.1 ASSUMPTIONS

The study assumed that-

- Pregnant women may have knowledge on m health app through health care personnel.
- Pregnant women may have previous knowledge about antenatal care which helps to improve the quality of life, maternal & fetal outcome

1.5.2 DELIMITATIONS

- The Study is limited to 160 pregnant women.
- The Study is limited to primi gravid women who booked
- In control group at the end of the third trimester information given which is available in the app. As a researcher would like to consider the beneficence for the control group, the app information has been given for the forth coming pregnancy.

1.4.1 CONCEPTUAL FRAMEWORK

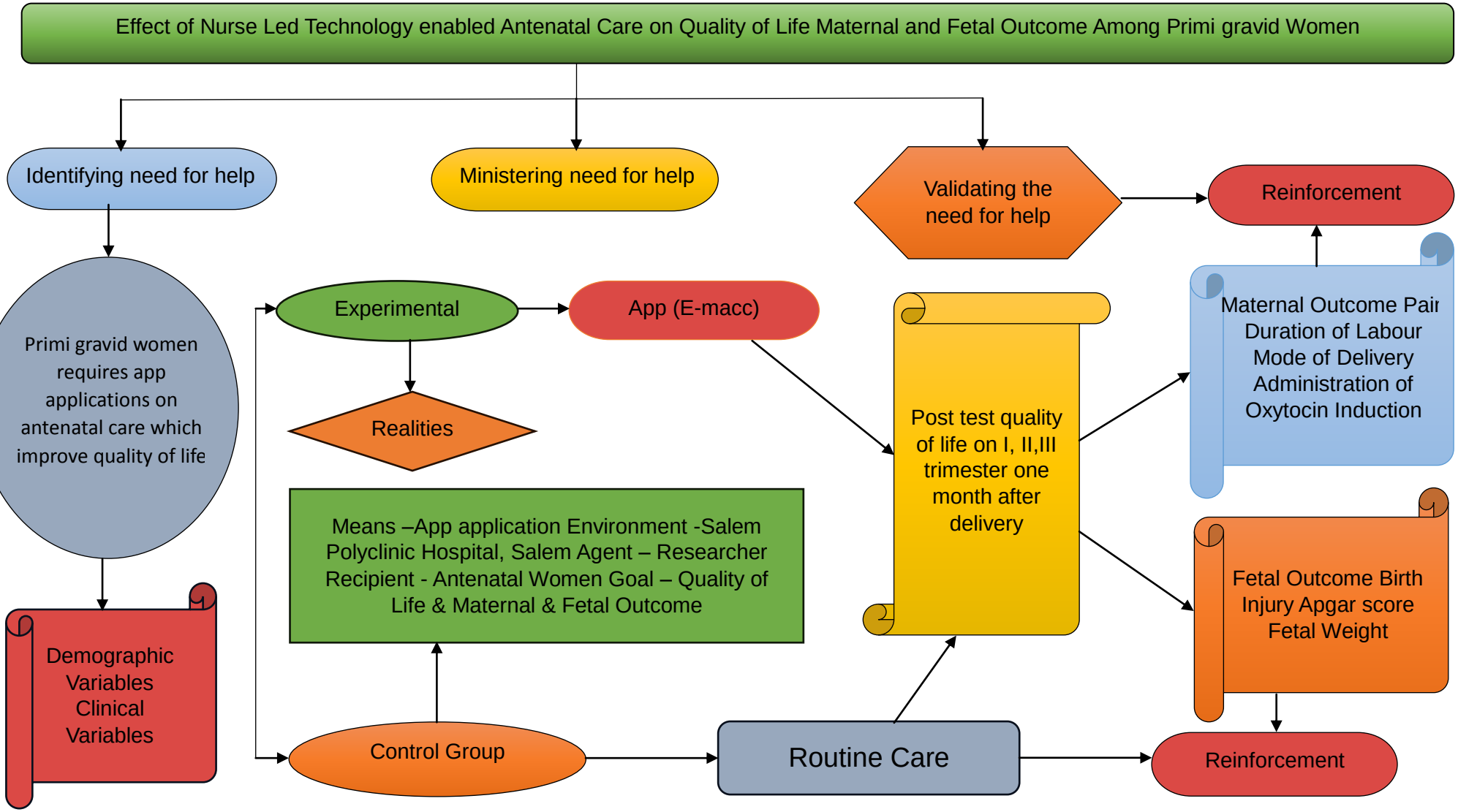

Effect of Nurse Led Technology enabled Antenatal Care on Quality of Life Maternal and Fetal Outcome Among Primi gravid Women
Identifying need for help
Ministering need for help
Validating the need for help
Reinforcement
Primi gravid women requires app applications on antenatal care which improve quality of life
Experimental
App (E-macc)
Realities
Post test quality of life on I, II,III trimester one month after delivery
Maternal Outcome Pair
Duration of Labour
Mode of Delivery
Administration of Oxytocin Induction
Means –App application Environment -Salem Polyclinic Hospital, Salem Agent – Researcher Recipient - Antenatal Women Goal – Quality of Life & Maternal & Fetal Outcome
Fetal Outcome Birth Injury Apgar score Fetal Weight
Demographic Variables
Clinical Variables
Control Group
Routine Care
Reinforcement

Fig-1: Effect of Nurse Led Technology Enabled Antenatal Care Among Primi Gravid Women, Based on Modified Widenbach Helping Art of Clinical Nursing Theory - 1964

CHAPTER II

REVIEW OF THE LITERATURE

The review of the literature is organized under the following sections.

Section I: Literature related to Antenatal Care:

Snigdha Soni [a], K. Aparna Sharma etal 2023 conducted a study on Implementation of the WHO ANC model using a web-based mobile application at different levels of the healthcare system. Aimed to develop a mobile application aligned with the WHO antenatal care model and follow a group of antenatal women using that and compare it to the conventional care provided. A prospective open-label study was carried out at three health centres, where patients with singleton/twin pregnancies and access to smartphones were recruited after obtaining informed consent. The study group was followed using the mobile application, while the control group received conventional care. A recall-based questionnaire was used to assess the content of care, including comprehensive history, examination, and patient counselling. Patient satisfaction and the feasibility of using the application were also evaluated. A total of 85 patients in the study group and 73 controls were followed until delivery. Baseline demographic details were comparable, while the number of antenatal visits was higher in the intervention group. Patients in the study group had significantly higher mean scores compared to the controls in terms of comprehensive history (8.26 ± 2.26 vs 3.58 ± 2.30; $p < 0.001$), physical examination (4.26 ± 1.03 vs 3.66 ± 1.09; $p = 0.001$) and patient counselling (6.09 ± 1.65 vs 4.33 ± 1.69; $p < 0.001$).Among the recommended investigations, a hemogram (100 % vs 93.2 %; $p = 0.02$) and ultrasound prior to 24 weeks (89.4 % vs 56.2 %; $p < 0.001$) were carried out in a larger number of patients in the study group. Patient satisfaction scores, calculated using the Pre MAPeQ questionnaire, were higher in the intervention group. This study highlights the effectiveness of an m-health application in enhancing the quality of antenatal care and facilitating standardized ANC visits. Further research is necessary to establish mHealth technology as a cost-effective intervention in this area.

Section II: Literature related to mobile app application on antenatal care

Souza FMLC, Santos WN, Santos RSC etal 2020 cconducted a study on Effectiveness of mobile applications in pregnant women's adherence to prenatal consultations: randomized clinical trial**.** To evaluate the effectiveness of a mobile application for cell phones in the adherence of pregnant women to prenatal consultations. A randomized controlled clinical trial, simple-blind with two parallel groups, conducted from January to December2018. Data collection was carried out through a structured interview at the end of the third trimester of pregnancy. For analysis, Chi-Square and Mann-Whitney tests were used. The sample consisted of 88 pregnant women from 2 Family Health Strategies in Northeast Brazil. Participants were randomized into two groups:

intervention (IG), who used the application, and control (CG), who attended prenatal consultations. Pregnant women who used the application (IG) attended a greater number of consultations when compared to participants in the CG, identifying a statistical difference between the groups ($p<0.05$). The application showed to be an effective health technology to improve adherence to prenatal care. Brazilian Registry of Clinical Trials: RBR-74SNST.

Section III: Studies related to mobile app on Antenatal Care on Quality of Life.

Seth Amponsah-Tabi 1*, Edward T. Dassah etal 2022 conducted study on an assessment of the quality of antenatal care and pregnancy outcomes. This study assessed ANC quality and its effect on adverse pregnancy outcomes among women who delivered at Komfo Anokye Teaching Hospital. A cross-sectional study was conducted among women who delivered at Komfo Anokye Teaching Hospital within the study period. Women were selected through systematic sampling and interviewed using a pretested structured questionnaire as well as review of their medical records. Data were collected on their socio demographic and reproductive characteristics, care provided during ANC and delivery outcomes. Categorical variables were compared using the $\chi 2$ test. Factors associated with quality of ANC and adverse pregnancy outcomes were assessed using univariate and multivariate logistic regression to generate crude and adjusted odds ratios (ORs) with 95% confidence intervals (CIs). Statistical analyses were performed using SPSS and GraphPad Prism. *P*-values of < 0.05 were considered statistically significant. 950 women were recruited into the study with mean age of 30.39±5.57 years. Less than one-tenth (7.6%) of the women received good quality ANC, 63.4% had average quality ANC, and 29.0% received poor quality ANC. Increasing educational level and initiating ANC in the first trimester [aOR 0.2; 95%CI 0.08–0.68; $p<0.001$] increased the odds of receiving good quality ANC while being unemployed decreased the odds of receiving good quality ANC [aOR 0.3; 95% CI 0.12–0.65; $p = 0.003$]. Receiving poor and average quality of ANC were significantly associated with increased likelihood of developing anaemia during pregnancy, preeclampsia with severe features or delivering a low birth weight baby.

Section IV: Studies related to Mobile app on Antenatal care on Maternal & fetal Outcome.

A Hijazi, A Althubaiti, H M AI-Kadri, 2019 conducted a study on effect of antenatal care on fetal, neonatal and maternal outcomes: a retrospective cohort study conducted at King Abdulaziz medical city (KAMC), Riyadh. The aim of this study: Is to evaluate the effect of antenatal care (ANC) on pregnant women in regards to maternal and perinatal outcomes, with attention being made to the difference between high and low risk mothers. This retrospective cohort study was conducted in the department of Obstetrics and Gynaecology at King Abdulaziz Medical City, Saudi Arabia, between 2011 and 2013. Four hundred mothers were divided into two

groups, whereas Group 1 had antenatal booking and group 2 didn't. Participants were classified based on their antenatal risks into high, intermediate or low risk. The chi-squared test or fisher exact test was used to compare difference in categories variables. Antepartum complications were significantly higher for booked compared to un booked mothers ($p<0.001$) booked mothers were less likely to be anemic ($p=0.02$). There was higher number of babies diagnosed with congenital anomalies in the booked group = ($p=0.015$). No significant difference was found in antepartum, fetal and neonatal complications between the booked mothers with four or less ANC visits and those with more than four. No significant difference was found between the number of ANC visits for mothers with low risk and those with intermediate/ high risk ($p=0.24$).

2.1 RESEARCH GAP

- Majority of studies employed only a smallest of indicators to assess quality.
- Some studies have shown increase in the number of visits and improvement in quality of care in terms of small subset of parameters.

CHAPTER III

RESEARCH METHODOLOGY

3.1 RESEARCH APPROACH

Quantitative evaluative research approach

3.2 RESEARCH DESIGN

True Study design (pretest, posttest control group).

3.3 RESEARCH VARIABLES

Independent Variable: Technology enabled Antenatal Care.

Dependent Variable: Quality of life, maternal and fetal outcome.

Matching Variable: Age, Education, Weeks of gestation

Demographic Variables: Age, education, occupation, Monthly Income**,** duration of marital life, and Type of Marriage.

Obstetrical Variables: Parity, weeks of gestation, type of visit, number of miscarriages

3.4 RESEARCH SETTING

Salem Poly Clinic Hospital in Salem**.**

3.5 POPULATION

TARGET POPULATION: All the primi gravid women**.**

ACCESSIBLE POPULATION All Primigravid women who are attending OPD in selected hospitals, Salem.

SAMPLE All primigravid women aged between 20-30 years in selected hospitals, Salem.

3.6 SAMPLING TECHNIQUE: Probability Simple random sampling technique (lottery method).

3.7 SAMPLE SIZE: Sample size derived by using power analysis however approximately were 160 primi gravid women, 80 in Study group and 80 in control group.

3.8 SAMPLING CRITERIA

INCLUSION CRITERIA

- Primigravid Women.
- Who have android phone.
- Who are willing to participate in the study.
- Who can understand and speak Tamil / English.
- Who can read and write Tamil / English.
- Who are available during the study period.
- Who are willing to deliver in the hospital.

EXCLUSION CRITERIA

Primigravid women with medical complications such as anemia, gestation diabetes obstetrical complications such as obstructed labour, prolonged labour, malpresentation, malposition, bad obstetrical history etcellitus, PIH, eclampsia, abortion etc.,

3.9 DATA COLLECTION TOOL

Section A: Data Collection Tool:

Part I : Demographic Variables

Part II : WHOQOL BREF Scale

Part III: Maternal Outcome

Part IV: Fetal Outcome

Part V : Perceived Satisfaction Questionnaire

Section B: Intervention Tool: App application (emaac).

Section C: Data Collection Tool

Part I: Demographic Variables

The structured interview schedule used to collect demographic variables such as age, education, occupation, type of marriage, duration of marital life, monthly family income, source of information.

Obstetrical Variables

Parity, weeks of gestation, type of visit, number of miscarriages

Part II: Quality Of Life

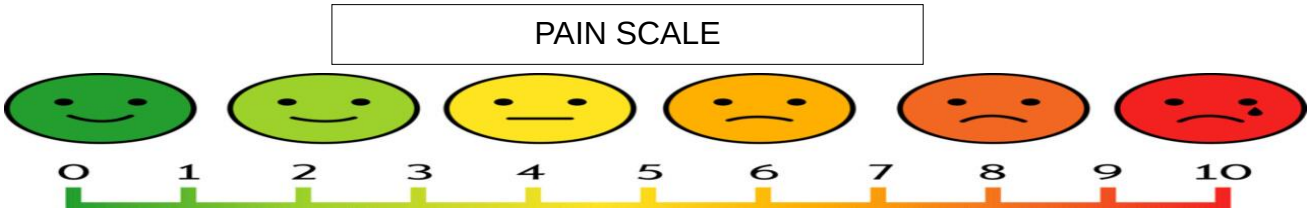
Quality of life measured by WHO QOL-BREF SCALE is a 26-item self-administered assessment designed to examine domain level profiles assessing quality of life. This assessment comprises of four domains (physical health, psychological, social relationships, and environment.) This section dealt with quality of life of pregnant women assessed by WHOQOL BREF Scale. It was developed by WHO.

DOMAINS	ITEMS
Physical health	7 items
Psychological health	6 items
Social relationship	3 items
Environmental health	8 items
General health & quality of life	2 items

Scoring & Interpretation:

Each item is rated in 5 point likert scale scored from 1 to 5 transformed scores 4-20, 0-100.

Part – III Maternal Outcome: Observational checklist



S.No		Parameters		
		1st Stage/II Stage		
1	Duration of Labour			
S.No	**Parameter**	Mode of Delivery		
		Spontaneous	Assisted Vaccum Forceps/LSCS	
1	Type of Delivery			
S.No	**Parameter**	Oxytocin Administration		
		Recommended	Less Likely	More Likely
1	Administration of Oxytocin Augmentation			

Part – IV Fetal Outcome: Observational Checklist

S.No	Fetal Outcome	Place for tick Mark		Remarks
		Yes	No	
1	Birth Injuries			
	Present			
	Absent			
2	Anger Score			
	Less than 4=0			
	4-7=1			
	More than > 7 =2			
3	Birth Weight			
	Less than 2500g=0			
	2500-3000g = 1			
	More than 3000g = 2			

Part – V Perceived Satisfaction Questionnaire

Classified as satisfied (more than 75-100%), moderate satisfied (51-75%) and unsatisfied (<50%).

3.10 VALIDITY OF THE TOOL

The study was discussed in the researched advised committee and approved. The suggestion was incorporated and later sent for validation from external experts. Content validity was obtained from research experts- 1 Psychiatrist, 1- clinical psychologist, 5 – Nursing experts from various institutions, 2- Physiotherapist, 1- web Designer, 1- Bio-Statistician.

3.11 RELIABILITY OF THE TOOL

The instrument used in the study are more standardized and widely used in many types of research. The quality of life has established by (Crohnbach alpha), maternal outcome and fetal outcome established by (interrater reliability)

r = 0.856 (Crohnbach alpha)

r = 0.78 (established by interrater reliability)

r = 0.8(established by interrater reliability**)**

3.12 PILOT STUDY

The pilot study was conducted in antenatal OPD at Salem Poly Clinic, Salem. After ensuring the validity and reliability of the tool among 30 primi gravid women (15 study group and 15 control group). The pilot conducted between April 2023-September 2023. The tools were found feasible and appropriate.

3.13 DATA COLLECTION PROCEDURE

Written Permission letter from the concerned authority of the hospital obtained from the Managing Director of Salem Polyclinic Hospital, Salem to conduct the study. 160 primigravid women,80 in Study and 80 in control group selected through probability simple random sampling technique. After obtaining written consent from the primigravid women, the demographic variables, Clinical Variables were obtained using structured interview schedule.

The sticker containing logo sticked on the intervention group case sheet. The samples watch the app every day that can be monitored by admin end. If any query the samples can use help desk which available in the app itself. The mobile app regarding antenatal care which includes checkup, diet, exercises, immunization, medication, travel, clothing, sex, warning signs.

The above information displayed in the mobile by pictures, images, where the antenatal women can read and make use of the details, also push up notifications regarding checkup, vaccination, drugs to be taken show as reminder till the date of delivery.

Pre test done on 12 weeks of pregnancy, regarding quality of life then interventions (mobile app) given for the samples in the Study group. Post test done regarding quality of life after delivery of the newborn and 1-month postpartum period, and maternal, fetal outcome measured by using observational check list.

3.14 DROP OUT ANALYSIS

Table 3.1: Drop out analysis of the sample.

ANALYSIS OF THE DROP OUTS IN FREQUENCY AND PERCENTAGE							
Group	**No of Drop out**	**Percentage (%)**	**Reason**	**Group**	**No of Drop out**	**Percentage (%)**	**Reason**
Study Group-(n=80)	**1**	**1.04**	**Shift to parent home**	**Control Group-(n=80)**	**1**	**1.04**	**Shift to parent home**
Total	**1**	**1.04**		**Total**	**2**	**2.08**	

*** Dropout are substituted since it is in initial stage.**

3.15 QUALITY ASSUARANCE OF THE INTERVENTION

Quality assurance of the Intervention monitored by Sr. Dr. Reshmi. Salem Poly Clinic Hospital, Salem.

3.16 ETHICAL CONSIDERATION

- The study was proposed in various Research Advisory Committee meetings and was revised. The study was also scrutinized from ethical concerns in the IEC/Salem Ploy Clinic Salem (IEC Approval NO: IEC/2022/July/01/01)
- The study was also registered and approved by the highest regulatory authority CTRI. (CTRI Approval No CTRI/2022/12/048086**)**
- Formal administrative permission was obtained from the Managing Director Salem Ploy Clinic Salem and concerned authorizes at the time of data collection.
- Participants were informed regarding the purpose of the study. Benefits were explained. Flexibility in withdrawal from the study was also ensured. Homogeneity was maintained with regard to the age, education weeks of gestation in both groups.

SCHEMATIC REPRESENTATION OF THE RESEARCH METHODOLOGY

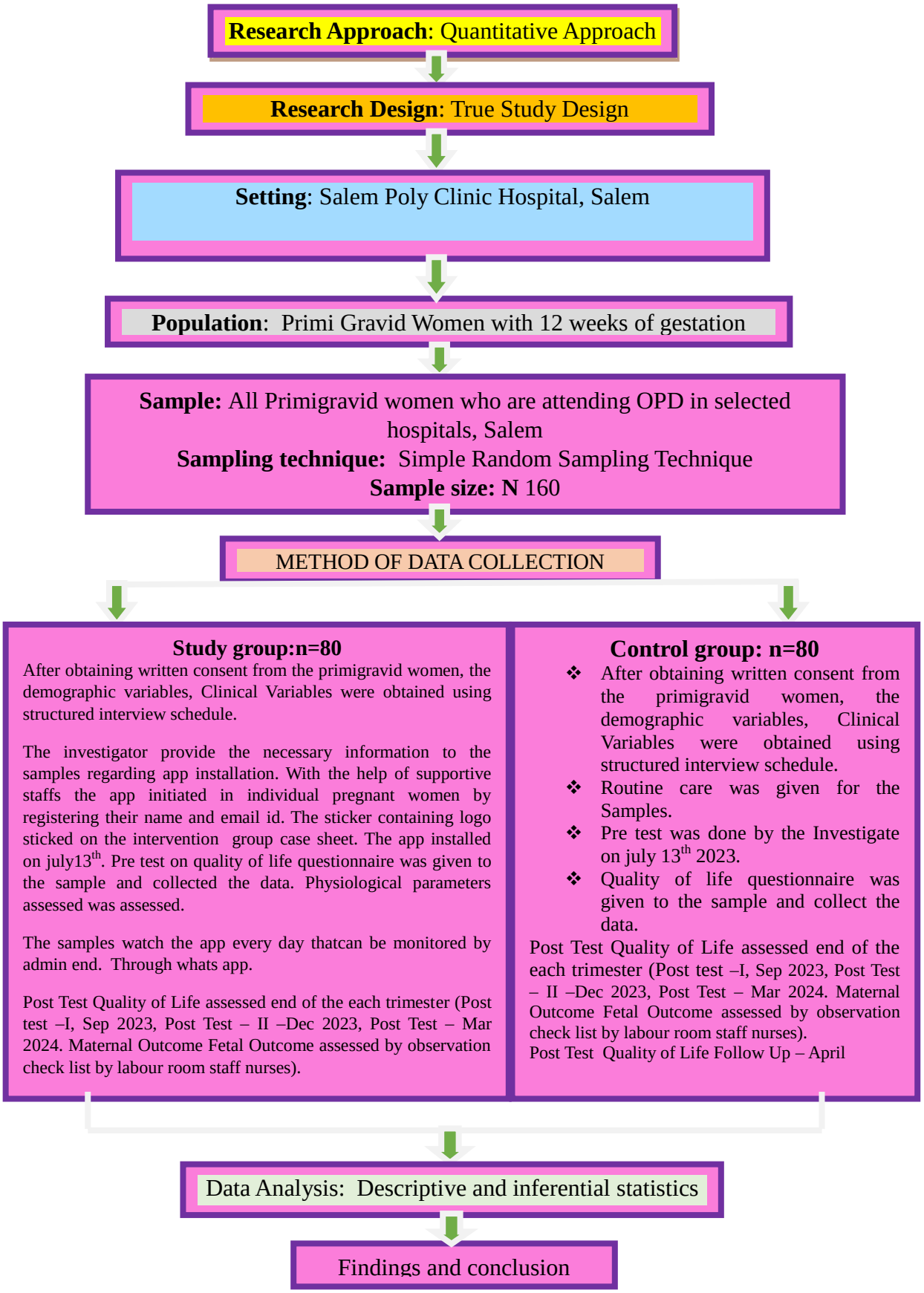

Research Approach: Quantitative Approach
Research Design: True Study Design
Setting: Salem Poly Clinic Hospital, Salem
Population: Primi Gravid Women with 12 weeks of gestation
Sample: All Primigravid women who are attending OPD in selected hospitals, Salem
Sampling technique: Simple Random Sampling Technique
Sample size: N 160
METHOD OF DATA COLLECTION
Study group:n=80
After obtaining written consent from the primigravid women, the demographic variables, Clinical Variables were obtained using structured interview schedule.
The investigator provide the necessary information to the samples regarding app installation. With the help of supportive staffs the app initiated in individual pregnant women by registering their name and email id. The sticker containing logo sticked on the intervention group case sheet. The app installed on july13th. Pre test on quality of life questionnaire was given to the sample and collected the data. Physiological parameters assessed was assessed.
The samples watch the app every day thatcan be monitored by admin end. Through whats app.
Post Test Quality of Life assessed end of the each trimester (Post test –I, Sep 2023, Post Test – II –Dec 2023, Post Test – Mar 2024. Maternal Outcome Fetal Outcome assessed by observation check list by labour room staff nurses).
Control group: n=80
After obtaining written consent from the primigravid women, the demographic variables, Clinical Variables were obtained using structured interview schedule.
Routine care was given for the Samples.
Pre test was done by the Investigate on july 13th 2023.
Quality of life questionnaire was given to the sample and collect the data.
Post Test Quality of Life assessed end of the each trimester (Post test –I, Sep 2023, Post Test – II –Dec 2023, Post Test – Mar 2024. Maternal Outcome Fetal Outcome assessed by observation check list by labour room staff nurses).
Post Test Quality of Life Follow Up – April
Data Analysis: Descriptive and inferential statistics
Findings and conclusion

Fig 2 : Schematic Representation of the Research Methodology

CHAPTER IV

DATA ANALYSIS & INTERPRETATION

DATA ANALYSIS

Data collected was analysed using IBM (International Business Machines Corporation) "Statistical Package for Social Science" (SPSS) software version 25.0. Data analysis was done based on the objective of the study using descriptive and inferential**.**

Demographic Variables:

A total 160 primi gravid women were enrolled in the study.

Description of Demographic Variables:

N 80 + 80 =160

Demographic variables	Control group (n=80)		Study group (n=80)	Homogeneity test $\chi 2$ value p-value	
	f	%	f	%	
1.Age in years: 20-22 years 23-25 years 26-29 years Above 29 years	18 20 26 16	22.5 25 32.5 20	31 32 15 2	38.75 40 18.75 2.5	$\chi 2$ =20.5 p<0.001***(HS)
2.Education: Illiterate Primary Secondary Graduate Post graduate Diploma and others	0 9 11 49 9 2	0 11.25 13.75 61.25 11.25 2.50	0 7 13 42 12 6	0 8.75 16.25 52.50 15 7.50	$\chi 2$ =3.38 p=0.496(NS)
3.Occupation: House wife Employee student Business	76 4 0 0	95 5 0 0	76 3 1 0	95 3.75 1.25 0	$\chi 2$ =1.143 p=0.565(NS)
4.Type of marriage: Consanguineous Non Consanguineous	0 80	0 100	0 80	0 100	$\chi 2$ =0 p=1(NS)
5.Duration of marital life: 0-1 year 1-2 years >2 years	57 10 13	71.25 12.50 16.25	48 18 14	60 22.5 17.5	$\chi 2$ =3.09 p=0.213(NS)
6.Monthly Income: <10000 10000-30000 30001-50000 >50001	19 30 31 0	23.75 37.50 38.75 0	17 26 37 0	21.25 32.50 46.25 0	$\chi 2$ =0.926 p=0.629 (NS)

In control group 18 of the samples between age group of study group 31 of samples belongs to the 20-22 years less number of samples between we age group of above 29 years where as in study groups 32 of them belongs to the age group of 23-25 years. In study group half of samples are graduates whereas in control 49 of them are graduates. In both groups none of them irritate. In study group & control groups equal number of samples 76 are house wife. Type of marriage in both groups none of the samples had consanguine type of marriage. In study group & control group37 of the sample's monthly family income between 30000-50000, whereas in both group none of their income >50000.

Description of Clinical Variables:

Clinical variables	Control group (n=80)		studygroup (n=80)		Homogeneity test χ2 value p-value
	f	%	f	%	
1.weeks of Gestation:					**χ2 =0**
12 weeks	80	100	80	100	**p=1(NS)**
2. No of visit:					
1-2	22	27.50	18	22.5	**χ2 =0.579**
3-4	26	32.50	29	36.25	**p=0.749(NS)**
5-6	32	40	33	41.25	
7-8	0	0	0	0	
3.Miscarriages:					
1	0	0	0	0	**χ2 =0**
2	0	0	0	0	**p=1(NS)**
4.Sources of information:					
Health care professional	45	56.25	51	63.75	**χ2 =0.937**
Mass media	35	43.75	29	36.25	**p=0.333(NS)**
5.Parity:					
Primi	80	100	80	100	**χ2 =0** **p=1(NS)**

In study & control group all the samples belong to 12 weeks of gestation. 33 samples had 5-6 Antenatal visit in both group none of the samples had miscarriage in both groups. In both groups half of the samples received information from health care professional all the samples belong to primigravida.

Objectives 1: To assess and compare the pre and post test quality of life and among primi gravid women in study and in control group.

Table 4.1: Compare the mean & standard deviation of pre post test scores of qualities of life among primi gravid women study & control group. N=80 + 80 = 160

Level of quality of life	Control group								Study group							
	Pre test		1st Post test		2nd post test		3rd post test		Pre test		1st Post test		2nd post test		3rd post test	
	f	%	f	%	F	%	f	%	f	%	F	%	f	%	f	%
Poor	**1**	**1.25**	**1**	**1.25**	**1**	**1.25**	**1**	**1.25**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Average	**79**	**98.75**	**79**	**98.75**	**79**	**98.75**	**79**	**98.75**	**80**	**100**	**69**	**86.25**	**38**	**47.50**	**35**	**43.75**
Good	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**13.75**	**42**	**52.50**	**45**	**56.25**

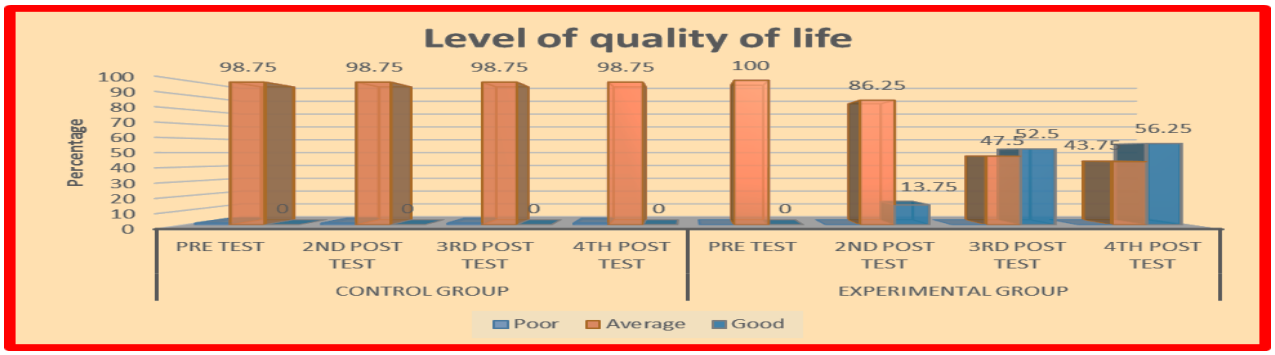


Figure : 02 Pre test & Post test Quality of Life in study& Control group.

Table 4.1: The Present study findings revealed that, in experiment group none of the samples had poor quality of life, whereas all the samples (100%) had average quality of life, where as in control group 79 of the samples had average quality of life.

In study group at the end of the post-partum period 45 (56.25) of the samples had good quality of life where as in control group none of the samples had good quality of life.

Table-4.2: Objectives 2: To assess and compare the maternal and fetal outcome in study and control group.

Maternal Outcome:

Table-4.2: Compare the maternal outcome in study & control group.

N=80 + 80 = 160

Level of pain	Control group		Study group	
	f	%	F	%
1-3	10	12.5	48	60
4-6	70	87.5	32	40
7-10	0	0	0	0
χ2 value p-value	χ2=39.05 p<0.001***(HS)			

N=80 + 80 = 160

Type of delivery	Control group		Study group	
	f	%	f	%
Spontaneous	70	87.5	72	90
Assisted Vacuum Forceps	10	12.5	8	10
χ2 value p-value	χ2=0.250 p=0.617(NS)			

Oxytocin Administration	Control group		Study group	
	F	%	f	%
Recommended	0	0	0	0
Less Likely	68	85	74	92.5
More Likely	12	15	6	7.5
χ2 value p-value	χ2=2.254 p=0.133 (NS)			

Table-4.2: The study findings regarding maternal outcome showed that, Level of Pain: In study group none of the samples had unbearable pain, 48 of the had mild pain, whereas in control group. 70 samples had moderate level of pain ie 4-6 score.

Type of Delivery: Specific to type of delivery, in study group most of the samples (72) had spontaneous delivery. Whereas in control group 70 of them had spontaneous delivery. Whereas in study group only 8 of them had assisted delivery. In control group 10 of them had AVP. Oxytocin Administration: In study group 74 of the samples had less likely to have oxytocin administration, whereas in control group 68 of them had less likely to administer oxytocin to the samples.

Fetal Outcome:

Table-4.2: Compare the fetal outcome in study & control group.

N=80 + 80 = 160

Level of Birth injury	Study group		Control group	
	F	%	f	%
Present	0	0	0	0
Absent	80	100	80	100

Level of apgar score	Control group		Study group	
	F	%	f	%
Less than 4	0	0	0	0
4-7	15	18.75	6	7.50
More than 7	65	81.25	74	92.50
χ2 valuep-value	χ2=4.439p=0.035*(S)			

Level of birth weight	Control group		Study group	
	F	%	f	%
<2500	2	2.5	0	0
2500-3000	41	51.25	38	47.50
>3000	37	46.25	42	52.50
χ2 value p-value	χ2=2.430p=0.297(NS)			

Table 4.2: The study findings regarding fetal outcome showed that, Apgar score: In study group newborn had apgar scoreless man 4 in study& control group. The newborn (81.25%) had apgar score more than 7.0 where as in control group 7.5% newborn had apgar score 4-7. Birth weight: In study group half of the newborn (42) had birth weight > 3000g whereas in control group half of the new born had birth, birth weight of 2500-3000g.

Table-4.3: Objectives 3: Paired "t"-test on overall quality of life in Study group among primi gravid women.

Table-4.3: Paired "t"-test was found between pre and post tests on overall quality of life in Study group among primi gravid women.

N=80

Overall Quality of life	SCORE		Pre Vs 1st post test		Pre Vs 2nd post		Pre Vs 3rd Post test	
	Mean	SD	Mean Difference	't' value p-value	Mean difference	't' value p-value	Mean difference	't' value p-value
Study pre test	43.88	3.60	12.43	t=13.36 p<0.001*** (HS)	18.47	t=11.93 p<0.001 *** (HS)	24.59	t=14.32 p<0.001 *** (HS)
1st post test	56.32	7.69						
2nd post test	62.36	13.80						
3rd post test	68.47	15.31						

Overall Quality of life	SCORE		1st post test Vs 2nd post		1st post Vs 3rd post		2nd post Vs 3rd Post test	
	Mean	SD	Mean Difference	't' value p-value	Mean difference	't' value p-value	Mean difference	't' value p-value
Study pre test	43.88	3.60	6.03	t=6.67 p<0.001 *** (HS)	12.15	t=10.86 p<0.001 *** (HS)	6.12	t=9.109 p<0.001 *** (HS)
1st post test	56.32	7.69						
2nd post test	62.36	13.80						
3rd post test	68.47	15.31						

Table-5 Unpaired "t"-test on level of quality of life in Study group and in control group among primi gravid women.

N=80 + 80 = 160

Quality of life		Control group		Study group		Mean difference	't'-value	P-value
		Mean	SD	Mean	SD			
Physical domain	Pre test	42.53	4.59	42.7	5.07	0.163	0.212	0.832 (NS)
	1st post test	42.68	4.83	52.41	9.85	9.725	7.926	p<0.001***(HS)
	2nd post test	42.84	4.96	62.38	13.11	19.55	12.47	p<0.001***(HS)
	3rd post test	42.98	5.08	65.56	14.37	22.57	13.24	p<0.001***(HS)
Psychological domain	Pre test	43.3	7.47	44.4	7.09	1.1	0.955	0.341 (NS)
	1st post test	43.37	7.45	55.03	7.79	11.66	9.67	p<0.001***(HS)
	2nd post test	43.45	7.55	61.2	14.52	17.75	9.70	p<0.001***(HS)
	3rd post test	43.45	7.48	66.08	15.22	22.64	11.94	p<0.001***(HS)
Social domain	Pre test	45.56	10.77	45.31	8.48	0.275	0.179	0.857 (NS)
	1st post test	45.92	10.52	60.43	14.04	14.52	7.405	p<0.001***(HS)
	2nd post test	46.225	10.39	64.77	19.09	18.55	7.63	p<0.001***(HS)
	3rd post test	46.375	10.41	78.18	21.23	31.81	12.03	p<0.001***(HS)
Environmental domain	Pre test	43.64	8.04	43.12	6.65	0.512	0.439	0.661 (NS)
	1st post test	43.78	7.99	57.4	12.09	13.62	8.39	p<0.001***(HS)
	2nd post test	43.79	7.9	61.06	17.03	17.27	8.21	p<0.001***(HS)
	3rd post test	43.86	8.02	64.06	17.58	20.2	9.35	p<0.001***(HS)
Overall quality of life	Pre test	43.76	4.29	43.88	3.60	0.118	0.189	0.850 (NS)
	1st post test	43.94	4.34	56.32	7.69	12.38	12.53	p<0.001***(HS)
	2nd post test	44.07	4.40	62.36	13.80	18.28	11.28	p<0.001***(HS)
	3rd post test	44.17	4.44	68.47	15.31	24.306	13.64	p<0.001***(HS)

Objectives 4: To correlate the mean pre and post test scores of quality of life with maternal and fetal outcome among the primi gravid women in study group and in control group**.**

Table No 6: Correlate the mean pre and post test score of quality of life, maternal and fetal outcome among primi gravid women in study and in control group.

N=80 + 80 = 160

Study group	Variables	Quality of life – APGAR Score	Quality of life –baby weight	Quality of life –labour pain
Study group 3rd post test	**'r'-value**	**0.075**	**-0.024**	**0.05**
	p-value	**0.509(NS)**	**0.827(NS)**	**0.6155(NS)**
Control group				
Control group 3rd post test	**'r'-value**	**0.233**	**0.288**	**-0.253**
	p-value	**0.037*(S)**	**0.009**(HS)**	**0.023*(S)**

Objectives 5: To associate the pre and post-test quality of life, maternal and fetal outcome among primi gravid women with their selected demo graphic and clinical variables in study and control group.

Table No 7. Association between the quality of life, maternal, fetal outcome among primi gravid women with selected demographic variables in study and control group.

N=80 + 80 = 160

Demographic variables	Control pre test				Study pre test			
	n	Mean±SD	F /t value (p-value)	Post hoc Test-sceffe test	n	Mean±SD	F /t value (p-value)	Post hoc Test-sceffe test
1.Age in years:	18	45.2±5.40	F=1.050	NA	31	44.14±4.24	F=1.177	NA
20-22 years	20	43.41±2.16	P=0.375		32	44.03±3.48	P=0.324	
23-25 years	26	43.66±4.97	NS		15	42.63±2.16	NS	
26-29 years	16	42.73±3.60			2	47.0±0		
Above 29 years								
2.Education:	0	0	F=0.386	NA	0	0	F=0.349	NA
Illiterate	9	43.86±5.21	P=0.818		7	43.07±2.37	P=0.844	
Primary	11	43.13±1.26	NS		13	43.31±4.38	NS	
Secondary	49	43.57±4.78			42	44.31±4.02		
Graduate	9	45.13±3.08			12	43.45±2.17		
Post graduate	2	45.50±4.24			6	43.95±2.36		
Diploma and others								
3.Occupation:	76	43.92±4.25	t=2.106	NA	76	43.95±3.68	F=0.315	NA
House wife	4	40.75±4.59	P=0.151		3	42.25±0	P=0.731	
Employee	0	0	NS		1	44.0±0	NS	
student	0	0			0	0		
Business								
4.Type of	0	0	F=0	NA	0	0	F=0	NA
marriage:	80	43.76±4.29	P=1		80	43.88±3.60	P=1	
Consanguineous			NS				NS	
Non Consanguineous								
5.Duration of	57	43.67±4.04	F=0.066	NA	48	43.83±3.52	F=0.166	NA
marital life:	10	43.8±3.44	P=0.936		18	43.67±3.45	P=0.847	
0-1 year	13	44.15±5.99	NS		14	44.37±4.56	NS	
1-2 years								
>2 years								
6.Monthly	19	43.61±2.78	F=0.108	NA	17	42.01±2.14	F=3.636	<10000
Income:	30	43.57±4.44	P=0.898		26	44.93±4.31	P=0.031*	VS
<10000	31	44.05±4.97	NS		37	44.01±3.33	S	10000-30000
10000-30000	0	0			0	0		(P=0.032 *)
30001-50000								
>50001								

Table No 8. Association between the quality of life, maternal, fetal outcome among primi gravid women with selected clinical variables in study and control group.

N=80 + 80 = 160

Clinical variables	Control pre test				Study pre test			
	n	Mean±SD	F /t value (p-value)	Post hoc Test-sceffe test	n	Mean±SD	F /t value (p-value)	Post hoc Test-sceffe test
1.weeks of Gestation: 12 weeks	0 80	0 43.76±4.29	F=0 P=1 NS	NA	0 80	0 43.88±3.60	F=0 P=1 NS	NA
2. No of visit: 1-2 3-4 5-6 7-8	22 26 32 0	44.09±2.94 43.67±4.74 43.61±4.78 0	F=0.086 P=0.917 NS	NA	18 29 33 0	43.68±4.48 44.18±3.855 43.73±2.87 0	F=0.152 P=0.859 NS	NA
3.Miscarriages: 1 2 NIL	0 0 80	0 0 43.76±4.29	F=0 P=1 NS	NA	0 0 80	0 0 43.88±3.60	F=0 P=1 NS	NA
4.Sources of information: Health care professional Mass media	45 35	43.32±3.97 44.33±4.67	t=1.035 P=0.304 NS	NA	51 29	43.81±3.57 44.01±3.73	t=0.247 P=0.805 NS	NA
5.Parity: Primary para	80	43.76±4.29	F=0 P=1 NS	NA	80	43.88±3.60	F=0 P=1 NS	NA

Objectives 6: To assess the post test level of perceived level of satisfaction among primi gravid women in study group.

Table-9: Comparative pre & post test level of satisfaction among primi gravid women in study group

N=80

Level of Satisfaction	Study group	
	F	%
Unsatisfied	**0**	**0**
moderate	**8**	**10**
Satisfied	**72**	**90**
Mean±SD	**59.6±3.13**	

CHAPTER V

RESULTS AND DISCUSSION

5.1 Objective 1:

Present study findings revealed that, in experiment group none of the samples had poor quality of life, whereas all the samples (100%) had average quality of life, where as in control group 79 of the samples had average quality of life.

In Study group at the end of the post partum period 45 (56.25) of the samples had good quality of life where as in control group none of the samples had good quality of life.

Lucia Mazuchor, Simuna Kelcikova, Zuzana Dubovicka conducted cross sectional study, on measuring women's quality of life during program. The study results showed that, the quality of life during pregnancy has proven to be very good excellent. Assessing quality of life is important interns of the timely preventive measure during pregnancy and should lead to an increase in the quality of care for pregnant women and their well being. Most women (55.60%) stated a very good quality of life 33.89% stated excellent. 9.86% stated good.

5.2 Objective 2:

Present study findings revealed that, in experiment group none of the samples had poor quality of life, where as all the samples (100%) had average quality of life, where as in control group 79 of the samples had average quality of life. In Study group at the end of the post partum period 45 (56.25) of the samples had good quality of life where as in control group none of the samples had good quality of life.

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5.3 Objective 3:

In control group overall quality of life, mean score 44.17 SD 4.444, whereas in Study group mean score 68.47 & SD 15.31 the mean difference 24.306, t value obtained 13.64, at $p< 0.001$ highly significant.

Shefaly Shorey, Yvonnepeng Mci Ng, Esperanza Debby Nq Anling siew etal. Conducted study of effectiveness of a technology based supportive educational parenting program on parental outcomes randomized controlled trail. Aim of the study: To evaluate the effectiveness of a technology based supportive educational parenting program o parenting outcomes during the perinatal periods in couples.236 parents recruited in the study. The study results revealed the intervention group sowed significantly better outcome scores than the control group.

5.4 Objective 4:

In Study group obtained t value was 0.075 whereas in control group 0.2333 quality of life / relation to apgar score. In contrast, Study group birth weight obtained value 0.024 whereas in control group 0.288. about correlative between quality of life / labour pain. In Study group obtained t value 0.05 & P value 0.6155 whereas in control group obtained t value -0.253, P value is 0.023* significant.

Hijazi, A Althubatti, HMAI-Kadri, conducted retrospective study on effect of antenatal care of fetal, neonatal and maternal outcomes. The study results revealed that ante partum intra-partum and post-partum complications. The results showed that, antepartum complications were significantly higher in booked m compared to un-booked mothers (31.5% vs 15.5%, mothers were more likely to deliver via a spontaneous vaginal delivery compared to booked mothers (78.5% vs 67.5%, p=0.013) fetal and neonatal complications. No statistically significant differences were found between booked and un-booked mothers in terms of mean birth weight, low birth weight, preterm deliveries, Apgar scores at 1 and 5 minutes.

5.5 Objectives 5:

In Study group association between quality of life with demographic variables monthly family income found significant associations.

Rabia Ishag, Maryaram Shoalb, Nosheen Si Kandar Blacoch, Abdul Sadig etal. Conducted study on profile and predictors of maternal quality of life during physiological prgnany. The study results revealed that most of the participants were in the age range of 26-35 years. Ninety were illiterate and the cohort was dominated by housewives (75.9%) the majority (91%) had rural residencies and 60% were in their second trimester the analysis reported a significant association between age, education occupation, Income marital status and trimester. Age was a significantly associate with the maternal QOL; women with higher education had better QOL, period of pregnancy significantly associated with QOL.

5.6 Objectives 6:

In Study group most of the samples (72) satisfied with app applications only 8 of the samples had moderate satisfaction mean value of 59.6+3.13. (Maron Mcnabb, Emcka Chukwn, Oluwayemisi Ojo, etal. Conducted the study on assessment of quality antenatal care services provided by health workers using a mobile phone decision support application in northern Nigeria. Aim: To assess the app applications had on quality ANC services provided. Totally 266 samples involved in the study. The study results revealed that introduction of mobile app can change the behaviour. Improve the quality of services provided by the health care workers & received information regarding grief satisfaction with the services the reared during their visit overall grief satisfaction as measured by proportion of clients who said they were satisfied with the ANC services increased from 75% at baseline to 83% at end line ($P<0.05$).

CHAPTER-VI

SUMMARY, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

6.1 SUMMARY

Based on the study mobile app application have a significant positive impact on quality of life, maternal and fetal outcome among primi gravid women. Mobile app application can help to improve the quality of life thereby the women get positive pregnancy experience. Used of advanced technology in pregnancy care has been increasing in recent years and there are promising researches in improving maternal and fetal outcomes.

6.2 CONCLUSION

- The quality of life was improved in Study group, because of mobile app intervention in all the aspects, especially physical domain, psychological domain, social domain, environmental domain, on the whole overall quality of life highly significant in Study groups compare to control group.
- Regarding maternal outcome, the test results un pained (T-Test) found it was highly significant in terms of pain., Oxytocin administration samples had less likely, that shows intervention is effective, also all the samples had spontaneous delivery.
- Regarding Fetal outcome apgar score was normal for majority of the new born, and none of the new born had birth injury after delivery and birth weight 3000gms its shows the intervention was effective. Pilot study concluded that the tool was found feasible and practicable.

6.3 STRENGTHS OF THE STUDY

- Comprehensive study is recommended throughout the country to generate the result.
- Recommended that pregnant women visiting private health care institute, should be added into the study to underline possible difference of QOL between public and private health care facilities.
- M health app administered during Antenatal period, which increases the effectiveness of application in improving quality of life and maternal fetal outcome.
- Cost effective, time consuming to meet the needs of the pregnant women and reduce the dependency on midwives.

6.4 LIMITATIONS OF THE STUDY

The study findings

- Comprehensive study is recommended throughout the country to generate the result.
- Recommended that pregnant women visiting private health care institute, should be added into the study to underline possible difference of QOL between public and private health care facilities.
- M health app administered during Antenatal period, which increases the effectiveness of application in improving quality of life and maternal fetal outcome.
- Cost effective, time consuming to meet the needs of the pregnant women and reduce the dependency on midwives.

6.5 RECOMMENDATIONS OF THE STUDY

- The study was single centred, consequently targeting other public, and private health care institute may bring diversity of findings. More over assessing quality of life in specific trimester can also bring interesting outcomes. Therefore, a study on different health care setting with individualized trimester is hereby recommended.
- Comparative study can be conducted on m health application on Antenatal care between booked & un booked mothers.
- Study can be conducted on m health application on high risk pregnant women such as PIH, Diabetes, and Obesity etc.
- Study can be conducted by using the health app, early detection of potential issues through regular monitoring.

6.6 IMPLICATIONS OF THE STUDY

Nursing administration

- Nurse administrators should take the initiative in organizing CNE programme, In-service educational program for nurses and motivate the nurses to participate in such activities.
- Nurse administrators should see that enough support is provided in terms of man power, money, material for disseminating health information regarding Antenatal care the study findings have shown clearly the responsibility of nurse administrators in organizing in-service education an such topics of importance.

Nursing Education

- Nurse educators can teach regarding mhealth applications in pregnancy, Quality of life, and perinatal outcome to the students in classrooms.
- Nurse educators can motivate the students to learn more on mhealth applications use during Antepartum, Intrapartum, and Postpartum for normal pregnant women, and high risk mothers.
- Nurses can be involved in organizing workshops, CNE, senior on mhealth applications its use.

Nursing practice

- Midwives can conduct regular Health education programs on the impact mhealth apps on social media.
- Nurses can involve the fathers in programme care and birth preparedness by using social media and health apps. The inclusion of fathers could improve health outcomes for the whole fairy.
- Future practice should consider attracting fathers to use mhealth relate services.

Nursing research

- Use of advanced technology in pregnancy care has been increasing in recent years and there are promising results in improving maternal health outcomes. Large scale clinical trials suggested in future studies. This is because interventions with smaller sample size are more likely to respect large effect size.

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